What is claimed is:

1. A semiconductor device having,

a silicon substrate,

a first conductive type impurity region provided in the silicon substrate with an upper surface being exposed on one main surface of the silicon substrate,

a second conductive type polysilicon plug provided in connection with the upper surface of the first conductive type impurity region to form a PN junction, and

wiring connected to a top of the second conductive type polysilicon plug.

2. The semiconductor device according to claim 1, wherein impurity density of the first conductive type impurity region is equal to impurity density of the second conductive type polysilicon plug.

3. The semiconductor device according to claim 1, wherein an upper surface of the silicon substrate and an upper surface of the first conductive type impurity region are in the same surface.

4. The semiconductor device according to claim 1, wherein the second conductive type polysilicon plug has a PN junction plug portion forming a PN junction with the first conductive type impurity region, and a wiring connection portion formed continuously and integrally with the PN junction plug portion and connected to the wiring.

5. The semiconductor device according to claim 1, wherein the second conductive type polysilicon plug is the PN junction plug portion that forms the PN junction with the first conductive type impurity region and is connected to the wiring.

6. The semiconductor device according to claim 1, wherein each of the upper surface of the first conductive type impurity region and a bottom of the second conductive type polysilicon plug has the same profile.

7. The semiconductor device according to claim 1, wherein the PN junction is formed only in one surface.

8. The semiconductor device according to claim 1, wherein the impurity density of the first conductive type impurity region is a value of 1.0×10^{15} cm^{-2} and the impurity density of the second conductive type polysilicon plug is a value within a range of 5.0×10^{14} cm^{-2} to 5.0×10^{15} cm^{-2}.

9. The semiconductor device according to claim 1, wherein the first conductive type is N conductive type and the second conductive type is P conductive type.

10. The semiconductor device according to claim 1, wherein the first conductive type is the P conductive type and the second conductive type is the N conductive type